

WHAT IS CLAIMED IS:

1. A computer system, comprising:
host computers,
a plurality of storage apparatuses, a unique ID that is unchangeable from outside being assigned to each of said storage apparatuses,
a switch for interconnecting said host computers with said plurality of storage apparatuses, and
a back end server connected to said host computers through said switch for managing said plurality of storage apparatuses so as to provide a virtual storage apparatus to said host computers, wherein said back end server dynamically modifies a storage apparatus from an arbitrary storage apparatus of said plurality of storage apparatuses to another storage apparatus thereof, said storage apparatus being caused to disguise said virtual storage apparatus.
2. The computer system as claimed in claim 1, wherein, while dynamically modifying said storage apparatus caused to disguise said virtual storage apparatus, said back end server makes no response to an access request made from said host computers to said virtual storage apparatus.
3. The computer system as claimed in claim 1, further comprising:
a data migration unit for migrating data in said arbitrary storage apparatus into said another

storage apparatus on a fixed-sized data block (LBA) basis, and

a table holding a flag for indicating a data migration state on said fixed-sized data block basis, wherein, in response to a writing request for said fixed-sized data block from said back end server, said data migration unit writes said data block into a corresponding storage position in said another storage apparatus, and after that, modifies a migration state of a flag to "data migration completed", said flag corresponding to said written-in data block in said table.

4. The computer system as claimed in claim 1, further comprising:

a data migration unit for migrating data in said arbitrary storage apparatus into said another storage apparatus on a fixed-sized data block (LBA) basis, and

a table holding a flag for indicating a data migration state on said fixed-sized data block basis, wherein, in response to a reading request for said fixed-sized data block from said back end server, said data migration unit

obtains a migration state of a flag by making reference to said table, said flag corresponding to said data block for which said reading request has been made, and, if said migration state is "data migration uncompleted",

migrates said corresponding data block from said arbitrary storage apparatus into said another storage apparatus, and

modifies said migration state of said flag to "data migration completed", said flag corresponding in said table to said data block for which said reading request has been made, and after that,

passes, to said back end server, said data block for which said reading request has been made.

5. The computer system as claimed in claim 1, wherein said switch is a fibre channel.

6. The computer system as claimed in claim 1, wherein said another storage apparatus has a data migration unit.

7. The computer system as claimed in claim 1, wherein said back end server has a data migration unit.

8. The computer system as claimed in claim 1, wherein said back end server and a data migration unit are built in said switch.

9. The computer system as claimed in claim 8, wherein said switch is a fibre channel.

10. A storage apparatus switching method in a computer system which comprises host computers, a plurality of storage apparatuses, a unique ID that is unchangeable from outside being assigned to each of said storage apparatuses, and a switch for inter-connecting said host computers with said plurality of storage apparatuses, said storage apparatus switching

method comprising the steps of:

causing at least one of said plurality of storage apparatuses to disguise a virtual storage apparatus so as to provide said virtual storage apparatus to said host computers, and

modifying at least one of said storage apparatuses dynamically from an arbitrary storage apparatus to another arbitrary storage apparatus, at least one of said storage apparatuses being caused to disguise said virtual storage apparatus.

11. The storage apparatus switching method as claimed in claim 10, wherein, while at least one of said storage apparatuses caused to disguise said virtual storage apparatus is being dynamically modified, no response is made to an access request made from said host computers to said virtual storage apparatus.

12. The storage apparatus switching method as claimed in claim 10, wherein said switch is a fibre channel.

13. A storage apparatus's data migrating method in a computer system which comprises host computers, a plurality of storage apparatuses, a unique ID that is unchangeable from outside being assigned to each of said storage apparatuses, and a switch for inter-connecting said host computers with said plurality of storage apparatuses, said storage apparatus's data migrating method comprising the steps of:

causing at least one of said plurality of storage apparatuses to disguise a virtual storage apparatus so as to provide said virtual storage apparatus to said host computers,

creating a table holding a flag for indicating a data migration state on a fixed-sized data block (LBA) basis,

prohibiting a response to an access request made from said host computers to said virtual storage apparatus,

modifying dynamically an arbitrary storage apparatus to another arbitrary storage apparatus as at least one of said storage apparatuses caused to disguise said virtual storage apparatus,

restarting said response to said access request made from said host computers to said virtual storage apparatus,

migrating said data block into said another arbitrary storage apparatus on said fixed-sized data block basis, said data block being stored into said arbitrary storage apparatus, and

executing, toward said another arbitrary storage apparatus, an access to said data block to be performed in response to said access request made from said host computers.

14. The data migrating method as claimed in claim 13, further comprising the steps of:

writing said fixed-sized data block into a

corresponding storage position in said another arbitrary storage apparatus in response to a writing request for said fixed-sized data block from said host computers, and after that,

modifying a migration state of a flag to "data migration completed", said flag corresponding to said written-in data block in said table.

15. The data migrating method as claimed in claim 13, further comprising the steps of:

obtaining, in response to a reading request for said fixed-sized data block from said host computers, a migration state of a flag by making reference to said table, said flag corresponding to said fixed-sized data block for which said reading request has been made, and, if said migration state is "data migration uncompleted",

migrating, from said arbitrary storage apparatus into said another arbitrary storage apparatus, said data block for which said reading request has been made,

modifying said migration state of said flag to "data migration completed", said flag corresponding in said table to said data block for which said reading request has been made, and after that,

sending said read-out data block to said host computers.

16. The data migrating method as claimed in claim 13, wherein said switch is a fibre channel.

17. A computer system, comprising:
a plurality of computers,
a plurality of storage apparatuses, and
a switch for interconnecting said plurality
of computers with said plurality of storage apparatuses, said computer system having means for providing a virtual storage apparatus to said plurality of computers, said virtual storage apparatus being a storage apparatus that is in a correspondence with at least one of said plurality of storage apparatuses, said means for providing said virtual storage apparatus modifying said correspondence dynamically.

18. The computer system as claimed in claim 17, wherein, when said means for providing said virtual storage apparatus has modified said correspondence dynamically, said means prevents said plurality of computers from seeing that said correspondence has been changed.